

I Number	Hits	Search Text	DB	Time stamp
1	46	(advanced adj micro adj devices) and dislocation	USPAT; US-PGPUB	2004/10/27 08:16
2	43	((advanced adj micro adj devices) and dislocation) and @ad<20020228	USPAT; US-PGPUB	2004/10/27 08:12
3	3	(advanced adj micro adj devices) and dislocation	EPO; JPO; DERWENT; IBM_TDB	2004/10/27 08:15
4	76	438/48,155,162,164,166,174,186.ccls. and dislocation	USPAT; US-PGPUB	2004/10/27 08:18
5	76	(438/48,155,162,164,166,174,186.ccls. and dislocation) not (((advanced adj micro adj devices) and dislocation) and @ad<20020228)	USPAT; US-PGPUB	2004/10/27 08:17
6	44	257/156,291,292,443,446,461.ccls. and dislocation	USPAT; US-PGPUB	2004/10/27 08:20
7	44	(257/156,291,292,443,446,461.ccls. and dislocation) not ((438/48,155,162,164,166,174,186.ccls. and dislocation) not (((advanced adj micro adj devices) and dislocation) and @ad<20020228))	USPAT; US-PGPUB	2004/10/27 08:20
8	44	((257/156,291,292,443,446,461.ccls. and dislocation) not ((438/48,155,162,164,166,174,186.ccls. and dislocation) not (((advanced adj micro adj devices) and dislocation) and @ad<20020228))) not (((advanced adj micro adj devices) and dislocation) and @ad<20020228)	USPAT; US-PGPUB	2004/10/27 08:20

US-PAT-NO: 6235599

DOCUMENT-IDENTIFIER: US 6235599 B1

TITLE: Fabrication of a shallow doped
junction having low sheet
resistance using multiple
implantations

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Brief Summary Text - BSTX (14):

For implantation of the relatively heavy dopant species, a high implantation energy may be used. However, with a high implantation energy, the amorphization implant profile 200 may be buried beneath the top surface 130 of the semiconductor substrate 102, as illustrated in FIG. 2. (Referring to FIGS. 1 and 2, the origin 201 of the x-axis in FIG. 2 represents the top surface 130 of the semiconductor substrate 102.) Referring to FIG. 2, the buried amorphization implant profile 200 is disadvantageous because an amorphization implant profile that is buried results in a doped junction with higher sheet resistance. In addition, the buried amorphization implant profile 200 has a first dislocation interface 202 and a second dislocation interface 204 where the concentration of the amorphizing implant species rapidly diminishes. Two such dislocation interfaces 202 and 204 may result in a doped junction with higher sheet resistance.

Detailed Description Text - DETX (6):

In addition, the projection ranges of the plurality of amorphizing implant profiles 402, 404, and 406 are controlled such that a top of the first implant

profile 400 is substantially at the top surface 130 of the semiconductor substrate 102. In that case, only one dislocation interface results at a first depth 410 of the first implant profile 400 where the concentration of the amorphizing implant species rapidly diminishes. The first depth 410 of the first implant profile 400 defines an amorphous region within the semiconductor substrate 102 formed by implantation of the amorphizing implant species.

Detailed Description Text - DETX (8):

In this manner, by forming an implant profile 400 that is substantially box-shaped for the implantation of the amorphizing implant species, the sheet resistance of the doped junction is minimized because of the more uniform concentration of the amorphizing implant species within the amorphous region. Referring to FIGS. 2 and 4, because the amorphizing implant species is already relatively uniformly distributed within the amorphous region of the present invention, the activation temperature and the activation time of the RTA (Rapid Thermal Anneal) process may be decreased. For example, the RTA process may use a relatively low temperature in a range of approximately 550.degree. Celsius to 700.degree. Celsius for a relatively short time period of 60 seconds. Such lower activation temperature and activation time results in less thermal diffusion and thus in a shallower doped junction. Furthermore, referring to FIGS. 2 and 4, because the implant profile 400 of the present invention has only one dislocation interface 410 (instead of two dislocation interfaces 202 and 204 in the prior art of FIG. 2), the sheet resistance of the doped junction of the present invention is further minimized.